

REMARKS

This request for reconsideration is filed in response to the final Office Action dated October 12, 2006. For the following reasons this application should be allowed and the case passed to issue.

Claims 1-14 are pending in this application. Claims 1 and 2 are withdrawn from consideration, pursuant to a restriction requirement. Claims 3-14 have been rejected.

Interview Summary

Applicants gratefully acknowledge the courtesy of Examiner O'Neill in conducting a personal interview with the undersigned on January 5, 2007. During the interview, the undersigned explained that the cited references did not suggest the thermally welding resin layer of a laminate sheet with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated, as required by the independent claims. The undersigned further explained that Yamazaki et al. do not disclose that resin 92 extends along the entire thermal welding area. In addition, the teachings in the specification and drawings were discussed. Furthermore, the undersigned asserted the separate patentability of the dependent claims. The Examiner indicated that further consideration of the arguments presented would be required upon filing a written response.

Restriction

The restriction requirement is traversed, and reconsideration and withdrawal thereof respectfully requested. As explained in the previous response, Groups I and II are clearly not related as intermediate-final product.

Claim Rejections Under 35 U.S.C. § 103

Claims 3-11, 13, and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al. (U.S. Pat. Pub. No. 2001/0038938) in view of Yamazaki et al. (U.S. Pat. No. 6,632,538). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention as claimed and the cited prior art.

An aspect of the invention, per claim 3, is a battery element internally sealed in a laminate sheet provided with a thermally welding resin layer and a metallic layer laminated thereon comprising an electric power generating element and a tab. The tab is formed with a thermally welding resin layer which is thermally welded with a thermally welding resin layer of a laminate sheet and connected to the electric power generating element with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated.

Another aspect of the invention, per claim 5, is a laminate battery comprising a tab and an electric power generating element connected to the tab. A laminate sheet allows the electric power generating element to be accommodated. The laminate sheet has a metallic layer and a thermally welding resin layer laminated on the metallic layer. The tab and the thermally welding resin layer are welded by permitting a thermally welding area, which is formed in at least one of the thermally welding resin layer and the tab, and the other of the thermally welding resin layer and the tab to be welded to one another with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated.

Another aspect of the invention, per claim 14, is a method of manufacturing a laminate battery comprising preparing a tab and an electric power generating element connected to the tab. A laminate sheet having a metallic layer and a thermally welding resin layer laminated on

the metallic layer is prepared. The tab and the thermally welding resin layer are welded, such that a thermally welding area formed in at least one of the thermally welding layer and the tab is welded to the other of the thermally welding layer and the tab with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated, while permitting the electric power generating element to be accommodated in the laminate sheet.

The Examiner asserted that Takahashi et al. disclose an electrochemical element sealed in a laminate sheet provided with a thermally welded resin layer and a metallic layer laminated thereon comprising: an electric power generating element (10) being sealed in an envelope (30) with terminal tabs (13, 14) extending out of the envelope (20). The Examiner acknowledged that Takahashi et al. do not disclose wherein the thermally welding resin layer of a laminate sheet is connected to the electric power generating element with an amount of resin allowing an amount of resin to be pushed outside the tab, to be compensated. The Examiner averred that Yamazaki et al. disclose tabs coated with an insulating film 92 formed of hot melt resins and extending on the outer and inner side edge of the case from which the tabs project. The Examiner concluded that it would have been obvious to use an insulating film or amount of resin pushed outside the tab in the battery of Takahashi et al. because Yamazaki et al. teach using insulating film is necessary because it is possible for tabs to come in contact with an exposed conductive layer of the laminating sheet.

Takahashi et al. and Yamazaki et al., whether taken alone or in combination, do not suggest the claimed battery element, laminate battery, and method of manufacturing a battery because Takahashi et al. and Yamazaki et al. do not suggest a tab formed with a thermally welding resin layer which is thermally welded with a thermally welding resin layer of a laminate sheet and connected to the electric power generating element **with an amount of resin allowing**

an amount of resin, to be pushed outside the tab, to be compensated, as required by claim 3; the tab and the thermally welding resin layer are welded by permitting a thermally welding area, which is formed in at least one of the thermally welding resin layer and the tab, and the other of the thermally welding resin layer and the tab to be welded to one another **with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated**, as required by claim 5; and welding the tab and the thermally welding resin layer, such that a thermally welding area formed in at least one of the thermally welding layer and the tab is welded to the other of the thermally welding layer and the tab **with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated**, while permitting the electric power generating element to be accommodated in the laminate sheet, as required by claim 14.

In the present invention the tab formed with the thermally welding resin layer which is thermally welded with the thermally welding resin layer of the laminate sheet and connected to the electric power generating element with the amount of resin allowing the amount of resin to be pushed outside by the tab, to be compensated; or the tab and the thermally welding resin layer are welded by permitting the thermally welding area, which is formed in at least one of the thermally welding resin layer and the tab, and the other of the thermally welding resin layer and the tab to be welded to one another with the amount of resin allowing the amount of resin, to be pushed outside by the tab, to be compensated.

Due to the structure of the present invention, a battery element and laminate battery are provided that enable the distance between the tab and the metallic layer of the laminate sheet to be ensured and also, enable the degradation of characteristics of the resultant laminate battery to be suppressed to the minimal extent.

The present invention enables the proper distance between the tab and the metallic layer of the laminate sheet to be ensured, and also suppresses, to a minimum, degradation of battery characteristics (see written description, page 2, line 29 to page 3, line 4).

Takahashi et al., on the other hand, disclose an electrochemical device having an electrochemical element (10) sealed in a bag-like envelope (20). More specifically, as shown in Figs. 8 and 9, Takahashi et al. teach that the electrochemical device has a stack of positive electrode layers (204), electrolyte layers (205), negative electrode layers (206), such a stack is sealed in the envelope (202) with the external electrode or out-lead (203) extending out of the envelope (202). The open ends of the envelope (202) with the external electrode (203) sandwiched therebetween are joined only by the thermal fusion to form the seal portion (207), and the external electrode or out-lead (203) is secured to the top side of the envelope (202) by only the adhesive layer (208), while the lowermost internal or positive electrode (204) is secured to the bottom side of the envelope (202) by only the adhesive layer (209). Takahashi et al. do not disclose that a tab is formed with the thermally welding resin layer which is thermally welded with the thermally welding resin layer of the laminate sheet and connected to the electric power generating element with the amount of resin allowing the amount of resin, to be pushed outside by the tab, to be compensated. Takahashi et al. further do not disclose that the tab and the thermally welding resin layer are welded by permitting the thermally welding area, which is formed in at least one of thermally welding resin layer and the tab, and the other of the thermally welding resin layer and the tab to be welded to one another with the amount of the resin allowing the amount of resin, to be pushed outside by the tab, to be compensated, as substantially defined in the specific structure of the present invention.

Yamazaki et al. disclose a sheet for a cell and a cell device having an insulating film 92 as shown in Figs. 55(a) to 55(c). However, the insulating film 92 just prevents the tabs 59 and 60 from short-circuiting in case the tabs 59 and 60 are bent to contact with each other or the conductive layer 2 of the laminate sheet of the case 51. For such a purpose, the insulating film layer 92 is provided to **extend only around the outer edge region** of the seal portion of the outer case 51. Thus, the insulating film layer 92 is not provided to extend along the whole contact region between the sealant layer 3 and tabs 59 and 60. Whereas, in embodiments of the present invention, the thermally welding resin layer extends along the whole contact region (105a) between the thermally welding resin layer and tab (see Fig. 3). Yamazaki et al. is not concerned with compensating the amount of resin pushed outside the tab during the welding process.

Even if Yamazaki et al. were combined with Takahashi et al., and Applicants do not believe it would have been obvious to do so, the combination of the Yamazaki et al. and Takahashi et al. would not suggest the claimed battery element, laminate battery, and method. The insulating film layer 92 of Yamazaki et al. would only be applied to the outer edge region of the seal portion of envelope 20, 202 of Takahashi et al. and, thus, would not compensate amount of resin pushed outside the tab.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al. in view of Yamazaki et al. and further in view of Watanabe et al. (U. S. Pat. No. 6,692,866). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The combination of Takahashi et al., Yamazaki et al., and Watanabe et al. do not suggest the claimed laminate battery because Watanabe et al. do not cure the deficiencies of Takahashi et al. and Yamazaki et al. Watanabe et al. do not suggest the tab and the thermally welding resin

layer are welded by permitting a thermally welding area, which is formed in at least one of the thermally welding resin layer and the tab, and the other of the thermally welding resin layer and the tab to be welded to one another **with an amount of resin allowing an amount of resin, to be pushed outside the tab, to be compensated**, as required by claim 5. Thus, claim 12 is allowable for at least the same reasons as claim 5.

Claim 12 is further distinguishable over the combination of Takahashi et al., Yamazaki et al., and Watanabe et al. because Watanabe et al. do not disclose the claimed relationship between the cross sectional areas of the positive electrode and negative electrode tabs.

The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend and further distinguish the claimed battery element internally sealed in a laminate sheet and laminate battery. For example, claim 7 further requires that a thickness of the thermally welding area of the thermally welding resin layer is determined to be larger than a thickness of a remaining area of the portion to be thermally welded by a value equal to or greater than one half of the thickness of the tab. The cited references do not suggest a laminate battery with these specific thickness limitations.

In light of the above Amendment and Remarks, this application should be allowed and the case passed to issue. If there are any questions regarding these remarks or the application in general, a telephone call to the undersigned would be appreciated to expedite prosecution of the application.

10/659,257

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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